

What is claimed is:

1. A method for the closed loop control of fiber orientation of a web in a papermaking process comprising the steps of:

a) performing on-line measurements of said fiber orientation;

b) transforming said on-line measurements to a plurality of indices;

c) comparing each of said plurality of indices arising from said transformed on-line measurements with an associated target and deriving therefrom a deviation for each of said plurality of indices from said associated target;

d) computing actions for controlling said fiber orientation based on said derived deviations and a response characteristic of said process; and

e) executing said control actions to minimize said derived deviations.

2. The method of Claim 1 wherein said method further comprises the step of obtaining from said on-line measurements of said fiber orientation a plurality of vectors each of which represent an associated one of a plurality of fiber orientation profiles and said transforming step includes the step of transforming each of said plurality of vectors to an associated one of said plurality of indices.

3. The method of claims 2 wherein each of said plurality of fiber orientation profiles $p(z)$ is transformed by the equation:

$$y = \frac{\int_{z_1}^{z_2} p(z)h(z)dz}{\int_{z_1}^{z_2} h^2(z)dz}$$

with a selected reference function $h(z)$ to produce an associated one of said plurality of indices.

4. The method of Claim 3 wherein each of said

logic selected from fuzzy or non-fuzzy logic or any combination thereof.

14. The method of Claim 12 wherein said plurality of logic stages comprises two fuzzy logic stages.

15. The method of Claim 12 wherein said plurality of logic stages comprises at least one stage that is fuzzy logic and at least one other stage that is non-fuzzy logic.

16. The method of Claim 1 wherein said executing step comprises the step of applying said control actions to control a papermaking machine having one or more headboxes.

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